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A Transactional Framework of Parenting for Children's Internet Use: A Narrative Review of Parental Self-Efficacy, Mediation, and Awareness of Online Risks

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Parental concern about children's media use has been a recurring issue in research on parent-child communication. For the past three decades, online risks associated with children's Internet use have also become a particular concern. However, recent evidence remains inconclusive about whether parental awareness of online risks is a result or antecedent of parental mediation of children's Internet use. The aim of this narrative review is threefold: to propose (a) a bi-factor conceptualization of parental mediation—enabling and restrictive mediation as two sides of the same coin; (b) a transactional conceptualization of relationships between parental awareness, mediation, and self-efficacy; and (c) a transactional framework of parenting for children's Internet use. Further research could test the proposed conceptualization and framework for distinguishing between when parental awareness is the result and antecedent of parental mediation.

Keywords: Internet use, online safety, online risk, parental awareness, parental self-efficacy, parental mediation

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Parental concern about children's media use has become more specifically about how to mediate children's Internet use in a way to minimize associated risks and maximize opportunities. Parental mediation of children's Internet use refers to parent-child interactions and efforts to observe, enable, and/or restrict online activities, conducts, contents, contacts, and privacy (Kuldas, Sargioti, Milosevic, & O'Higgins Norman, 2021). Parental mediation is both promotive and protective (Clark, 2011; Kuldas et al., 2021). Promotive efforts aim to develop children's digital literacy skills and willingness to access and use online opportunities (e.g., knowledge acquisition, social interaction, and identity development) as well as to enable children to avert/tackle online risks. Protective efforts intend to prevent harmful online content, contact (Staksrud, Livingstone, & Haddon, 2007), conduct (Staksrud & Livingstone, 2009), and contract (Livingstone & Stoilova, 2021). An online risk has an aggressive, sexual, value-laden, and/or commercial nature, which leads to its intersectional manifestation (Livingstone & Stoilova, 2021; Staksrud & Livingstone, 2009). Examples are pornographic or violent videos (content risk), grooming (contact risk), cyberbullying behaviors (conduct risk), and commercial misuse of personal data (contract risk).

Although not every online risk experience is harmful (Staksrud & Ólafsson, 2020), little is known about how parents become aware of their children's harmful risk experiences and their needs for promotive-protective efforts. Prior research has mainly focused on prevention rather than awareness of online risks and, therefore, lacked a theoretical framework that explains (a) how parental awareness, mediation, and self-efficacy affect each other in parenting for children's Internet use (Symons, Ponnet, Emmery, Walrave, & Heirman, 2017) and (b) how the promotive-protective efforts vary according to parent-child-risk transactions. This *transaction* is defined as the transformation of and being transformed by interactions between parent-child-risk characteristics (Kuldas & Foody, 2022). Future research needs such a transactional account to explain the following:

- Parental mediation: What do parents do to prevent their children from experiencing risks online?
- Parental awareness: Do parents know or correctly estimate how often their children experience risks online?
- Parental self-efficacy: How confident are parents in their abilities to prevent their children from experiencing risks online?

Research has thus far been based on a unidirectional conceptualization of relationships between parental mediation strategies (restrictive, enabling, and observant) and awareness. Earlier studies conceptualized parental awareness as a predictor of parental mediation (Racz & McMahon, 2011), whereas recent studies conceptualized parental awareness as an outcome of it (Lippold, Greenberg, Graham, & Feinberg, 2014; Symons et al., 2017). It remains unclear whether parental mediation, especially restrictive mediation, is a result or an antecedent of parental awareness of the child's online risk experience (Caivano, Leduc, & Talwar, 2020). One reason for this ambiguity could be a unidimensional operationalization of restrictive mediation as only rule-setting for protective aims (i.e., taking no account of its promotive aims) before and after parental awareness (Kuldas et al., 2021). Another reason could be parental efficacy beliefs that determine both parental mediation and awareness (Caivano et al., 2020).

Parental self-efficacy refers to parent's confidence in parenting for children's Internet use; this confidence is based on parent's promotive-protective abilities and efforts, such as digital literacy skills, open parent-child communication, and rule enforcement (Festl & Gniewosz, 2019). However, recent evidence

indicates that parents who overestimate their confidence are less aware of how frequently their child has experienced online risks (Barlett & Fennel, 2018; Caivano et al., 2020). Confident parents tend to underestimate how frequently their child has experienced online risks; for example, as a perpetrator (Byrne, Katz, Lee, Linz, & McIlrath, 2014) or victim of cyberbullying (Symons et al., 2017). In contrast, unconfident parents tend to overestimate how frequently it has happened. This finding raises a further question: Is the lack of awareness (overestimation/underestimation of the frequency of online risk experience) a result or an antecedent of parental self-efficacy?

The present narrative review argues that the ambiguity, as to whether parental awareness predicts mediation and self-efficacy or the reverse, is attributable to the unidimensional operationalization of restrictive mediation and unidirectional operationalization of parental self-efficacy (Glatz, Crowe, & Buchanan, 2018), parental mediation (Sasson & Mesch, 2014), and parental awareness (Symons et al., 2017). Therefore, this review has a threefold aim, proposed under three main sections. The first proposition is a bi-factor conceptualization of parental mediation, defining that parental mediation is unidimensional as a single/general factor and at the same time multidimensional, having sub-factors as restrictive, enabling, and observant mediation. The second proposition is a transactional conceptualization of relationships between parental awareness, mediation, and self-efficacy. The third proposition is a transactional framework of parenting for children's Internet use. Such a bi-factor and transactional approach may allow further research to test *transactions* within and between parent-child-risk characteristics, thereby explaining when parental self-efficacy, mediation, or awareness is an antecedent and when it is an outcome of their dynamic relationships. However, unlike a systematic review, this narrative review is not based on inclusion and exclusion criteria for searching and synthesizing evidence or studies.

A Bi-Factor Conceptualization of Parental Mediation

A recent review and content validation of 10 parental mediation scales identified three interdependent strategies: restrictive, enabling, and observant (Kuldas et al., 2021). First, restrictive parental mediation involves verbal and nonverbal/technical settings and monitoring rules for the child's access and use of the Internet. Examples of nonverbal restriction and monitoring are using filters, logging in to the child's social media accounts, or checking browser history. Next, enabling parental mediation is based on considering the child as agentic online, promoting the child's agency in purposefully using the Internet as well as recognizing and disclosing any online risk experience. Last, observant parental mediation is likely to be for Internet use by preadolescents (under 12 years of age) more than adolescents by intermittently observing (being watchful of and alert or attentive to) both the child's behavior and the screen (smartphone, tablet, or computer) when the child is online. However, there is no conformity about distinct mediation strategies, but common to all is restrictive versus enabling parental mediation (Livingstone et al., 2017).

Recent research on restrictive mediation and parental awareness has remained inconclusive about whether parents set rules as a result of their awareness of an online risk the child has experienced or with the hope of becoming aware of an anticipated online risk (Caivano et al., 2020). This could be because research operationalized restrictive mediation as a unidimensional construct (i.e., protective but not promotive rule setting). As explained by parental mediation theory, "restrictive mediation tends to involve parent-to-child communication in the form of rule-making, rule-stating, and following through with

consequences when rules are not followed" (Clark, 2011, p. 326). Restrictive mediation can hereby be defined as a multidimensional/protective-promotive process (e.g., choosing rules), capacity (e.g., enforcing rules), outcome (e.g., setting additional rules), and monitoring (e.g., checking whether the child abides by rules). Moreover, rule setting is not necessarily based on a rational decision about why, when, where, or how long the child is allowed or not allowed to use the Internet (van Kruistum & van Steensel, 2017). It can also be unconsciously triggered or guided by some irrational reasons or emotions, such as unrealistic worry, fear, desire, or hope (Clark, 2011). Hence, a multidimensional conceptualization of restrictive mediation is needed for prospective research to distinguish among rule-setting forms as described below.

Rule setting can be classified into four forms: protective, promotive, risk-outcome, and generating risk awareness. First, *protective rules* aim to prevent the child from anticipated online risks, for example, the child is not allowed to access or give out personal passwords. Second, *promotive rules* intend to enable parent-child communication about online risks, such as telling the child to add someone to their personal social network only after conferring with the parents. Third, *risk-outcome rules* can be set after parental awareness of an online risk the child experienced, such as not allowing the child to continue playing an online game that induces the child to engage in self-harming behavior. Last, *rules for generating risk awareness* can be stated preconditions for observing and monitoring online activities, such as telling the child to use the parent's laptop or not to delete any received, sent, and forwarded online posts (messages, photos, videos, audios), which may allow parents to check for the child's online risk of being a target or perpetrator of cyberbullying. However, rule setting is less likely to be effective unless children abide by rules willingly (Clark, 2011).

Given that any of these rules can be verbally set either before or after an online risk experience, rule setting before parents become aware of their child's online risk experience is an antecedent of parental awareness. Rule setting after parents become aware of their child's online risk experience is a consequence of parental awareness. However, some rules, such as allowing the child to use the Internet only through the parent's computer or smartphone, or when the parent is present, can be the antecedent, result, or both. This rule setting can be considered as restrictive, observant, and enabling mediation. For instance, in recent research (Nimrod, Elias, & Lemish, 2019), restrictive and nonrestrictive (co-use, instructive, supervision) types of mediation were very highly correlated (r = .767, p < .01). Such inter-factor correlation indicates common more than unique variance (Rönkkö & Cho, 2022) among restrictive, enabling, and observant mediation strategies.

The high inter-factor correlation further suggests that parental mediation can be modeled as bi-factor—unidimensional (the general factor) and multidimensional (restrictive, enabling, observant). Although recently few studies conceptualized (see Jiow, Lim, & Lin, 2016) and operationalized (see Lin, Vijayalakshmi, & Laczniak, 2019) parental mediation as the general factor, it is yet to be tested. Further research is needed to test this bi-factor conceptualization, testing the extent to which parental mediation as the general factor and a specific dimension is the antecedent or consequence of parental awareness.

A Transactional Conceptualization of Relationships Between Parental Awareness, Mediation, and Self-Efficacy

The question, whether parents set rules as a result (past) or with the hope (future) of becoming aware of online risks, postulates the unidirectional conceptualization of parental awareness. However, rule

setting as the hope of becoming aware is not parental awareness but mediation to protect and promote child development before (future) and after (past) an online risk experience. Therefore, parental awareness can be an outcome in the past as well as in the future. Becoming aware of an online risk experience is an outcome of bidirectional actions by parent, child, or parent-child. Hence, what parents do to become aware of online risks makes parental mediation an antecedent of parental awareness. After their awareness, what parents do makes parental mediation an outcome of parental awareness. In this sequence, parental mediation may come first and then parental awareness; and in turn, the same or a modified mediation strategy (i.e., bidirectional effects) may take place.

Future research could focus on one or both directions (before and/or after parental awareness). For instance, without focusing on how parental awareness determines bidirectional effects between parental self-efficacy and mediation strategies, it could focus on how parental self-efficacy determines and is determined by a specific mediation strategy. When parents become aware of the effectiveness of their mediation strategy, their self-efficacy is likely to increase (Glatz et al., 2018). The lack of parental awareness can hinder their self-efficacy in a mediation strategy, preventing parents from adjusting their practices to their children's needs for Internet use (Caivano et al., 2020).

In a nutshell, to *Do,* to *Know,* and to have *Confidence* (rather than to have *Confidence,* to *Do,* and to *Know*) are, respectively, the antecedent, defining attribute, and consequence of parental awareness in the future (before the awareness of children's online risk experience). However, to *Know,* to *Do,* and to have *Confidence* are, respectively, the antecedent, defining attribute, and consequence of parental efficacy in securing the child's safety online in the *past* (after the awareness). Figure 1 depicts this bidirectional/transactional framework.

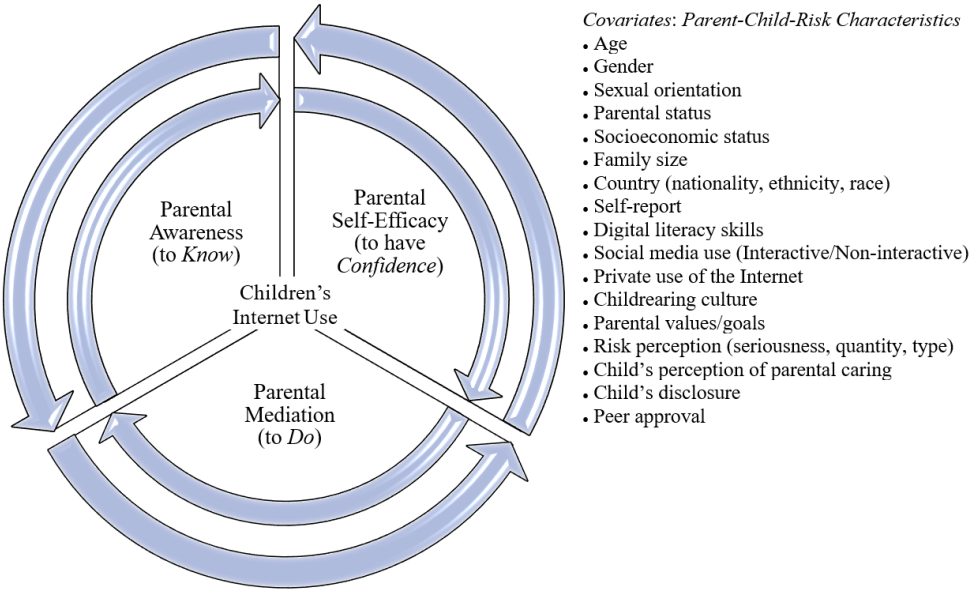

Figure 1. A transactional framework of parenting for children's Internet use.

Bidirectional Effects Between Parental Self-Efficacy and Awareness

Parental self-efficacy in securing their children's online safety is very likely to be a determinant of parental (un)awareness of their children's experience of risks online (Barlett & Fennel, 2018; Glatz et al., 2018; Livingstone, Haddon, Görzig, & Ólafsson, 2011). Highly confident parents are mostly unaware of how frequently their children have experienced an online risk, as a victim (Caivano et al., 2020; Symons et al., 2017) or perpetrator of cyberbullying (McGuire & O'Higgins Norman, 2017). Hence, higher parental self-efficacy can be a risk factor inhibiting parental awareness.

However, recent studies (Caivano et al., 2020; Symons et al., 2017) remained largely inconclusive: Why do parents underestimate how frequently their children have experienced risks online? One reason might be measurement issues rather than the parental estimation itself (i.e., a lack of scales for accurately measuring parental self-awareness). Another reason could be the lack of a conceptual framework for parental awareness (Symons et al., 2017). A further reason is consistent with the notion of a third-person effect where parents often underestimate their own children's online risk experiences as compared with others' children (Clark, 2011). Parents may view their own child as more mature than others or be overconfident in the child's own ability to tackle online risks (Livingstone & Helsper, 2008). Further research is needed to provide empirical and theoretical insights into the extent to which parental self-efficacy determines and is determined by levels of their awareness (i.e., underestimation, overestimation, or accurate estimation of the frequency of online risk experience). It can be tested that the higher (or lower) the parental self-efficacy in the child's Internet use, the lower (or higher) the parental awareness of online risks, or the reverse.

Bidirectional Effects Between Parental Self-Efficacy and Mediation

Parental self-efficacy is conceived to be in bidirectional relationships with mediation strategies; it directly affects and is affected by parents' actions taken for their children's online safety/risks (Festl & Gniewosz, 2019). Glatz and colleagues (2018) found that parents with higher self-efficacy were more effective through restrictive, enabling, and observant mediation; therefore, the authors argued that parents with higher self-efficacy engage in two or more mediation strategies to elicit more information about their children's online behaviors. When parental perception of the child's online risks is high, highly confident parents tend to use restrictive mediation more than other strategies (Festl & Gniewosz, 2019). In contrast, further evidence indicates that parents having high self-efficacy are less likely to choose restrictive mediation (McGuire & O'Higgins Norman, 2017). Due to these inconsistent findings, the likelihood of any relationship between parental self-efficacy and mediation strategies should be tested further. The higher (or lower) self-efficacy, the more (or less) restrictive and enabling mediation can be expected. Hence, it can be hypothesized that parental self-efficacy is likely to predict and be predicted by restrictive, enabling, and observant mediation.

Bidirectional Effects Between Parental Mediation and Awareness

Although the three mediation strategies are expected to predict parental awareness, enabling mediation appeared to be the best predictor in few studies (e.g., Australian Office of the eSafety Commissioner [OeSC], 2018; Byrne et al., 2014; Cerna, Machackova, & Dedkova, 2015). Symons and colleagues (2017) argued that enabling mediation might be a better strategy compared with restrictive mediation because it

involves open parent-child communication. However, their own study showed limited evidence and, therefore, concluded that none of the mediation strategies, including open parent-child communication, could be associated with parental awareness. More recent research (Caivano et al., 2020) also found no significant relationship between restrictive mediation and parental awareness. The extent to which parental awareness makes a change in parental mediation is also unclear, such as whether parents become more restrictive and less enabling, or the reverse. Further research is needed to test whether restrictive, enabling, and observant parental mediation strategies predict and/or are predicted by levels of parental awareness.

Indirect Effects Between Parental Self-Efficacy, Mediation, and Awareness

A more consistently supported assumption is that parents having higher self-efficacy are less likely to choose restrictive instead of enabling and observant mediation (Duerager & Livingstone, 2012). Nevertheless, such parental confidence in the ways they mediate their children's Internet use does not necessarily make them aware of online risks. As found in a series of empirical (Byrne et al., 2014; Caivano et al., 2020; Symons et al., 2017) and descriptive studies (McGuire & O'Higgins Norman, 2017), most parents, who overestimated their confidence in enabling mediation, were unaware of how frequently their children experienced risks online. However, other parents, who always or usually set rules for their children's Internet use, also underestimated how frequently their adolescent was a victim of cyberbullying (Dehue, Bolman, & Völlink, 2008) or a perpetrator (Barlett & Fennel, 2018). Barlett and Fennel argued that such parental unawareness may happen when restrictive parents have lower levels of self-efficacy. This argument raises the question: Do unconfident parents overestimate how frequently their children have experienced risks online? Testing this assumption requires further research on how restrictive, enabling, observant strategies mediate the relationship between parental self-efficacy and awareness.

A Transactional Framework of Parenting for Children's Internet Use

Bidirectional effects between parental self-efficacy, mediation, and awareness are not independent parent-child-risk characteristics, but little is known about this dependency (Caivano et al., 2020). For instance, fear is likely to be what motivates parents to engage in restrictive mediation when they want to protect their children from online risks. This does not suggest that parents practicing an enabling or observant strategy do not want or believe in parental protection. Instead, they might believe in the child's self-protection from harmful experiences online (Clark, 2011). In a much earlier study (Nathanson, Eveland, Park, & Paul, 2002), parents not practicing restrictive strategy believed that their child had the ability to recognize harmful content.

Nevertheless, such parental confidence in the child's ability does not mean these parents have less or no fear (sense of protection). Children's intrapersonal and interpersonal characteristics (cognitive, affective/motivational, biological/physical, family, social, and risk characteristics) can determine the parental sense of protection through enabling and observant rather than restrictive mediation. However, there is no consensus on whether children's or parents' characteristics mostly determine parental self-efficacy (Staksrud & Ólafsson, 2020), mediation, and awareness (Symons et al., 2017). Parent-child characteristics that shape the preference for a specific mediation strategy (Clark, 2011; Kalmus, Sukk, & Soo, 2022; Livingstone et al., 2017) are likely to determine parental self-efficacy and awareness (Staksrud & Ólafsson, 2020) as well. Notable parent-child-risk characteristics can be grouped into five transactional effects, as given below.

1. Transactional child-technology-parent characteristics are the child's privatization of Internet use, freedom in time and space for being online, and digital literacy skills as compared with parents.
2. Transactional child-risk characteristics are age, gender, and country in association with types of online risks.
3. Transactional child-parent characteristics are the child's disclosure (i.e., the willingness to disclose an online risk experience), perceived difficulty in parent-communication (e.g., fear of more restrictions), and the child's versus the parent's self-reports.
4. Transactional child-peer characteristics include peer approval and other school- and neighborhood-related factors.
5. Transactional parent-risk characteristics are perceived seriousness, quantity, and type of online risks, which are moderated by differences in the parent's country of residence (nationality/race/ethnicity), child-rearing culture, parental values, family size, gender, parental status, and socioeconomic status.

Child-Technology-Parent Transactions

The Child's Privatization of Internet Use and Freedom in Time and Space

A private smartphone, laptop, or tablet allows for the child's privatization of Internet use, which can be an essential factor underlying parental unawareness (Sorbring, 2014). In particular, a personal smartphone allows for more private use of the Internet and a degree of freedom in time and space (i.e., away from their parent's tracking, observing, or monitoring eyes). It can hereby increase the chance of experiencing online risks, especially when using social media platforms for self-presentation or self-disclosure (Valkenburg & Peter, 2011). Therefore, parents struggle to balance giving their children privacy online and trying to protect them from risks (Livingstone et al., 2017). Raising this concern, the vast majority (95% of 3,520 Australian parents) in a recent study (OeSC, 2018) agreed that they need online safety information about ways to maintain their children's privacy and agency online, to protect their children from online risks, and to recognize signs/symptoms of their children's experience of an online risk. Further research on this concern is needed to determine the extent to which the child's privatization of Internet use and time-space freedom affect parental awareness, mediation, and self-efficacy.

Digital Literacy Skills: Child Versus Parent

Parental mediation strategies can vary according to their own self-efficacy in using the Internet (Nimrod et al., 2019; Sonck, Nikken, & de Haan, 2013). Parents having proficient skills, such as knowing how to check reliability of information (text, video, photo), are likely to have higher confidence in mediating their children's online activities. Such parental confidence was reported by the majority of a convenience sample of 908 parents in Ireland; almost 80% reported high confidence in coping with an online threat to their children, while 75% felt they were sufficiently engaged in the prevention (McGuire & O'Higgins Norman, 2017). However, these confident parents reported less awareness than they initially claimed. Instead of restrictive mediation, they relied heavily on their "children telling them what they did online" (McGuire & O'Higgins Norman, 2017, p. 66). This finding is in line with earlier research in the United Kingdom, which showed enabling mediation was preferred more among Internet-skilled parents (Livingstone & Helsper, 2008). As such, if parents with higher self-efficacy take restrictive actions, they will likely have higher awareness.

However, parental confidence in restrictive measures might also render them unaware of online risks. Parents and children usually have different skills for using the Internet and digital technology (Livingstone et al., 2017). Children who have superior digital skills can easily bypass or ignore rules their parents set. In such cases, parents are likely to lack confidence in their ability to help their children but instead believe that their children are more capable of coping on their own with their online experiences (McGuire & O'Higgins Norman, 2017). Such parental confidence in their child's digital literacy skills might in turn render parents mostly unaware of online risks.

Child-Risk Transactions

Age

Younger and older children have different needs for Internet use. As children get older, parents need to tailor their mediation strategies to their children's needs (Staksrud & Ólafsson, 2020). Parents tend to give their adolescents more freedom/space for Internet use (van Kruistum & van Steensel, 2017) by enforcing fewer rules (Nikken & Jansz, 2014) or no restrictions (Glatz et al., 2018). For example, parents of two- to five-year-olds tended to be restrictive, whereas those with six- to 17-year-olds preferred an open parenting style (OeSC, 2018). Parents might feel no use of restrictions on adolescents' Internet use due to their tendency to disobey rules (Caivano et al., 2020). In a study (Ho, Chen, & Ng, 2017), adolescents were less responsive to restrictive mediation, which appeared to be effective in reducing cyber-aggression in younger children. This further implies that the child's age and types of online risks are likely to be linked, thereby affecting differences in parental mediation and awareness. For instance, to be a target, perpetrator, or bystander of cyberbullying may require different mediation strategies for different age groups, thereby leading parental awareness to differ for younger and older children's experiences of online risks (Caivano et al., 2020).

Differences in the child's age and risk types may lead parents to overestimate/underestimate the frequency of online risk experiences (Caivano et al., 2020). However, further research is needed to test whether parental awareness really increases, or if it is an overestimation. In the study by Caivano and colleagues (2020), parents of an elementary school child underestimated the child's engagement in cyber-aggression, whereas parents of a high school adolescent overestimated the adolescent's engagement in cyber-aggression. This overestimation is likely to be what some other studies found as increased parental awareness (see OeSC, 2018). Further research is required for a comparison of child age groups by levels of parental awareness, mediation strategy, and self-efficacy.

Gender

The child's gender might influence parents' self-reports of their own self-efficacy, mediation, and awareness. However, this influence is inconsistently found. In some studies, the child's gender had a significant effect on parental awareness, explaining the difference in the mother and father's awareness (Caivano et al., 2020; Symons et al., 2017). In other studies (OeSC, 2018), there was no significant difference in parental awareness, but in parental mediation; parents of girls were more likely to engage in multiple actions when dealing with an online risk experience than parents of boys.

The types of online risks parents anticipate for boys can differ from those for girls. For example, boys are expected to engage in content risks (e.g., pornographic and violent), while girls are more at risk of being a victim of cyberbullying (Symons et al., 2017). A recent study using children's self-reports (Wright, 2017) found child's gender moderating associations between parental mediation and cyber-victimization. As compared with boys, the association with restrictive mediation was more positive but negative with enabling mediation for girls. Parents, who believe that girls might be more vulnerable to exploitation online, tend to implement strategies for their daughters' Internet use more often than for their sons (Wright, 2017).

Country

Children in different countries are likely to experience different online risks (Kirwil, 2009). For instance, in a study a decade ago, adolescents in Ireland were more likely to experience violent rather than pornographic content risks (Staksrud & Livingstone, 2009). Similar online content risks, such as (consensual or nonconsensual) sharing of sexual images among adolescents, have become a cause for worry among one-third of Irish parents participating in a descriptive study (McGuire & O'Higgins Norman, 2017).

Child-Parent Transactions

The Child's Disclosure of Online Risk Experience

In an Australian study, nearly 66% of parents, who were aware of their child's online risk experience, reported their child disclosing it, 19% found out themselves, and 6% found out from their child's school teacher (OeSC, 2018). This evidence supports a conventional argument that children play a more important role than parental mediation in parental awareness (Kerr, Stattin, & Burk, 2010). In a longitudinal study, the child's disclosure predicted parental awareness but not parental mediation (Kerr et al., 2010). However, in another longitudinal study, both the child's disclosure and parental mediation predicted parental awareness (Lippold et al., 2014).

Therefore, to determine relationships between a specific mediation strategy and parental awareness, the child's disclosure can also be taken into account. In several studies, children's perception of enabling but not restrictive mediation was linked to an increased probability of the child's disclosure of experience as a victim of cyberbullying (Cerna et al., 2015). This probability was decreased when the child perceived difficulty in child-parent communication on online risks (Byrne et al., 2014).

An alternative contemporary argument is that parental awareness is based on child-parent transactional characteristics. For instance, the amount of information a child discloses to their parents depends on both (a) the child's perception of the parent or parenting style as caring or not (Cottrell et al., 2015) and (b) parental efforts to solicit or elicit information from their child (Lippold et al., 2014). However, the parent-child perspective is yet to find consistent empirical evidence. In a longitudinal study in the Netherlands, reciprocal relationships between parental mediation (including the solicitation for information) and the child's disclosure positively predicted each other over time (Keijsers, Branje, VanderValk, & Meeus, 2010). Such a positive relationship did not appear in a longitudinal study (Kerr et al., 2010) on 13- to 14-year-old children in central Sweden. In some instances of being a victim of cyberbullying, children are afraid to tell their parents to avoid

more restrictions. This might be a reason why restrictive mediation can be ineffective or even be a parental risk factor for children who have been victims of cyberbullying. Further research is needed to examine the child's disclosure effect on parental awareness, mediation, and self-efficacy.

Self-Reports: Child Versus Parent

Studies on parental awareness and mediation are based on self-reports by a parent, child, or both. A lot more is known about maternal than paternal awareness due to the fact that mothers usually report, particularly when only one parent is required to participate (Symons et al., 2017). As a notable example, in the EU Kids Online study (Livingstone et al., 2011), mothers as three of four parents from all the 25 participating countries, appeared to be the parent most aware of their children's Internet use. In another study (Byrne et al., 2014), 94.1% of the sampled parents were mothers.

Although findings based on self-reports by only the mother, father, child, or parent-child are inconclusive (Byrne et al., 2014; Caivano et al., 2020), an increasingly held view suggests that the extent of parental awareness is more accurately measured by studies that include both child and parent perspectives (Symons et al., 2017). In some descriptive and empirical studies, reports from child-parent perspectives indicated a discrepancy between parents' and children's beliefs about exposure to online risks. For instance, with regard to being a victim or perpetrator of cyberbullying, studies found that (a) while 33% of children reported they were the victim, only 4% of parents believed this happened to their child (Livingstone & Bober, 2004); (b) while 17.3% of children reported they cyberbullied someone, only 4.8% of parents believed their child did that (Dehue et al., 2008); (c) only one in three parents accurately knew how frequently their children were victims or perpetrators of cyberbullying (Byrne et al., 2014); and (d) mothers and fathers did not differ in their awareness of how frequently their child faced risks online, but only one in four mothers and one in three fathers accurately knew how often their child was a victim of cyberbullying (Symons et al., 2017). Therefore, some studies considered triadic (child-mother-father) data collection as a reliable method for a comparison between parental self-reports of the child's online behavior and the child's self-reports (Symons et al., 2017).

However, studies using this method have concluded that children tend to report a higher frequency of online risk experiences, whereas parents tend to underestimate it (Byrne et al., 2014; Caivano et al., 2020; Symons et al., 2017). As such, the norm-referenced assessment of the parent-child discrepancy can be misleading when it is based on no criterion-referenced evidence for an action/behavior of either the parent or child that substantiates the frequency estimation. As an alternative to this norm-referenced comparison, the parental self-report of mediation strategies can be used as one criterion for a comparison between levels of parental awareness and self-efficacy. This criterion reference can serve further research on testing whether parents with higher/lower self-efficacy overestimate/underestimate the frequency of online risk experiences. For example, when confident parents were asked how they knew about their children's risk experience, "they more heavily relied on their *children telling them what they did online*" than on any restrictive-monitoring mediation (McGuire & O'Higgins Norman, 2017, p. 66; emphasis in original).

Child-Peer Transactions

Peer Approval

Restrictive mediation can also be less effective when peers approve the child's engagement in an online risk, such as meeting face-to-face with a stranger they met online (Sasson & Mesch, 2014). In a study on the peer-norm effect among 10- to 16-year-old children in a large city in Israel, the perceived peer approval reduced the effectiveness of restrictive mediation (Sasson & Mesch, 2014). Such an approval leading to online risks may evade parental awareness. In an empirical study, parents identified that a classmate (31%) or friend (22%) was responsible for their child's negative online experience, while a further 28% indicated that a stranger was responsible (OeSC, 2018).

Parent-Risk Transactions

Parental perception of the seriousness, quantity, and type of an online risk can also determine what mediation strategy parents choose and how confident they feel before or after the awareness. Effects of such parental perceptions on parental mediation, self-efficacy, and awareness are likely to be moderated by differences in their demographic characteristics, such as country of residence (nationality, ethnicity, race), family size, gender, sexual orientation, parental status, and socioeconomic status as well as by their social-psychological characteristics, such as parental values and child-rearing culture and goals.

Risk Perceptions

Risk Seriousness

Parental mediation can vary according to their perceptions of risks and opportunities associated with children's noninteractive viewing of audiovisual content and interactive use of media, such as for learning, social communication, and/or entertainment (Nimrod et al., 2019). In a study, parents who perceived watching YouTube as contributing to child development reported lower restrictive mediation (Nimrod et al., 2019). However, two questions remain unclear. First, do parents engage in enabling or restrictive mediation when they observe that their children's noninteractive use, such as spending hours watching YouTube, is not contributing to child development? Second, how do parents become aware of whether the contents of a social media platform, such as YouTube, Facebook, Instagram, or TikTok, are contributory or not?

Regarding the first question, findings are inconsistent. Evidence from eight European countries indicated that as parental perception of an online risk rises, parents engage in enabling but less restrictive mediation; this is because, when parents become worried as a result of parental awareness, they might believe that enabling mediation alone is insufficient (Livingstone et al., 2017). In contrast, evidence for Australia indicated parental engagement in more protective actions, monitoring or restrictive mediation, as a result of their awareness (OeSC, 2018). In another empirical study (Festl & Gniewosz, 2019) involving a sample of 952 families in Germany, with higher risk perception of their children's Internet use, both mothers and fathers reported more restrictive mediation. However, whether the preference for restrictive mediation

is a result of children's actual or expected online risk experience is largely unclear. Further research is needed to test whether the more aware of their child's actual risk experience they are, the more restrictive parents are. Prospective findings might suggest what mediation strategy is best for the prevention or reduction of an online risk when parents become aware of it.

As to the second question, an explanation can be found by identifying whether parents themselves are users of social media platforms. Parental awareness and perception of online risk seriousness may also depend on whether a parent is an interactive/active user (posting or interacting online) or noninteractive/passive user (reading or watching online) of social media platforms such as Instagram, TikTok, and YouTube (Lin et al., 2019). Unlike passive users, active users may want to understand how new forms of social media work and know about associated risks and opportunities, and thus, develop parental self-efficacy, competency, and control beliefs in parental mediation (Lin et al., 2019). For example, active users may hereby become aware of how social media influencers and their online posts stimulate the child's interest in using or buying some products or brands, which parents perceive as harmful to their child (Lin et al., 2019). Therefore, unlike active users, passive users may not perceive a product or brand as harmful to their children who are followers or exposed to social media influencers endorsing the same product or brand on one or more of the social media platforms (Lin et al., 2019). Among parents participating in an empirical study, passive users had more positive views of social media influencers and saw no need for parental mediation (Lin et al., 2019).

Risk Quantity

Levels of parental self-efficacy can vary as a result of parental awareness of specific or multiple risks online. In the random sample of 3,520 parents of children (aged 2–17) in Australia (OeSC, 2018) more than half reported less or no confidence in their ability to deal with certain online risks. Only 46% felt confident to deal with various online threats, specifically cyberbullying (as a victim). Another 46% knew where to go to get help. Further research that focuses on parental-self efficacy might test the reverse conceptual model, that is, if parental awareness determines parental self-efficacy and mediation strategies.

Risk Type

Parental awareness is very likely to vary according to the types of online risks. For instance, parents are more aware of their children's experience as a victim (but not as perpetrator or bystander) of cyberbullying than other online risks, but they tend to underestimate how frequently it happens (Caivano et al., 2020; Symons et al., 2017). They are less or not aware of their children's risk experience of cyberbullying as a perpetrator, and therefore, tend to estimate no incident (McGuire & O'Higgins Norman, 2017). Further research using items measuring parental awareness of a specific risk that children experience online might yield accurate results (Symons et al., 2017).

Moderators

Country (Nationality or Ethnicity)

Country of residence makes a substantial difference in parental awareness, mediation strategy, and self-efficacy in their children's experience of online risks (Livingstone et al., 2011; Staksrud & Ólafsson, 2020). For instance, enabling mediation is likely to be common among parents in Australia (OeSC, 2018), Ireland (McGuire & O'Higgins Norman, 2017), Spain, and Italy, but less in Sweden and the Netherlands (Livingstone et al., 2017). However, whether such cross-national differences also exist between ethnic majority and minority groups is unclear. Some evidence suggests that parents of both an ethnic majority (Barlett & Fennel, 2018) and an ethnic minority or immigrant group (Bayraktar, 2017) may practice more restrictive mediation due to their lower self-efficacy level. Further research is needed to focus on nationality- or ethnicity-based self-efficacy in children's online safety/risks in relation to parental mediation and awareness.

Child-Rearing Culture and Parental Values

Parental mediation can be guided or triggered by parental values and attitudes toward child-rearing, which is based on culture, political ideology, moral code, or model. Therefore, national, ethnic, or cultural differences may account for differences in parental mediation strategies and self-efficacy levels (Clark, 2011; Kalmus et al., 2022; Kirwil, 2009; Staksrud & Ólafsson, 2020). For example, parental mediation of children's Internet use may depend on individualistic and collectivistic child-rearing values and attitudes (Kirwil, 2009). Parents with individualistic values may favor enabling mediation that promotes the child's autonomy, individuality, and open parent-child communication, thereby promoting the child's digital literacy skills rather than protecting them from online risks (Kirwil, 2009). In contrast, parents with collectivistic values (e.g., requiring obedience and compliance with a social or religious order) may favor restrictive mediation to protect from online risks rather than promote the child's digital literacy skills (Kirwil, 2009).

However, such a dichotomy of individualistic versus collectivistic parental mediation is not necessarily fixed or specific to some countries, societies, or cultures. Both individualistic and collectivistic preferences may exist within the same country/society and coexist within the same parent. For example, earlier research showed that a large sample of parents in Austria, Belgium, France, Germany, the United Kingdom (Helsper, Kalmus, Hasebrink, Sagvari, & de Haan, 2013), the Netherlands, and Sweden (Livingstone et al., 2017) preferred more restrictive than enabling mediation, unlike the common assumption that these European countries have Western individualistic values. Moreover, as found in a comparison of 12 European countries (Kalmus et al., 2022), based on the EU Kids Online survey in 2010 and 2018, preference for a parental mediation strategy changes over the years in the same country. The comparison found more enabling and less restrictive mediation in Norway and Finland, moderate levels of both in Germany, and highest levels of both in France. As such, parental mediation strategies can be based on more individualistic and less collectivistic values, the reverse, or on the same levels within the same country.

Family Size

Both individualistic and collectivistic mediation strategies can also depend on parents' self-efficacy, which is likely determined by the number of children they have, their experience with their older child(ren),

or supportive siblings (especially those close in age). However, their experience with either more or fewer children does not necessarily mean higher parental confidence. In earlier studies, parents with two (Kirwil, 2009) or more children (Sonck et al., 2013) applied more restrictive than enabling mediation. In a conservative society (Israeli Arabs living in northern Israel), parents with one to three children ranked higher scores for restrictive mediation than those with four or more children (Peled, 2018). Hence, further research is needed to explain how mediation strategies vary according to relationships between parental confidence, child-rearing culture, and the number of children.

Gender

Mothers and fathers can differ in their perceptions of seriousness, quantity, and type of online risk, thereby leading to differences in their self-rated parental self-efficacy, mediation strategies, and awareness (Festl & Gniewosz, 2019; Glatz et al., 2018; Symons et al., 2017). In an earlier study (Liau, Khoo, & Ang, 2008), mothers reported more accurate awareness of their child's online experiences. Festl and Gniewosz (2019) hypothesized that this could be because mothers tend to engage in all the mediation strategies more than fathers, but their study found no support for this hypothesis. Instead, they found that more accurate awareness and perceived seriousness of the child's risk experiences were associated only with more restrictive mediation by both mothers and fathers with higher self-efficacy (Festl & Gniewosz, 2019). In a similar study (Symons et al., 2017), more enabling mediation among mothers, who perceived higher self-efficacy than fathers (i.e., perceived themselves as more knowledgeable than fathers), was strongly linked to their less accurate awareness.

All these parental differences, however, do not necessarily mean that mothers and fathers do not influence each other's perception and mediation of children's Internet use. Notwithstanding their parental differences, mothers and fathers are not mutually exclusive in perceptions of their children's online risks and choices for a mediation strategy. As found in a recent study (Festl & Gniewosz, 2019) in Germany, fathers' higher risk perception positively influenced mothers' use of restrictive mediation, even more than her own perception of children's online problems. This interdependent effect needs to be taken into account in further research.

Parental Status

Parental status as biological, single, step, or same-sex parent might also yield differences in mediation strategies and parental awareness levels (Symons et al., 2017). In particular, it is yet to be studied whether same-sex parents have higher parental self-efficacy, mediation, and awareness than heterosexual parents. Therefore, the inclusion of same-sex parents would enhance the understanding of differences that are typically found between maternal and paternal mediation of children's online safety (Symons et al., 2017).

Socioeconomic Status

Parental mediation strategies also vary according to parents' socioeconomic status (SES; Festl & Gniewosz, 2019; Livingstone, Mascheroni, Dreier, Chaudron, & Lagae, 2015) and work schedules (Clark,

2011). In a series of studies (Livingstone et al., 2015), parents with lower SES had highly restrictive mediation of their children's Internet use, especially technical restrictions for one- to seven-year-old children (Nikken & Schols, 2015). However, parents with higher SES also practiced more restrictive mediation of younger children's than older teens' Internet use (Livingstone & Helsper, 2008). While the child's age difference has such an interaction effect, parents' digital skills might have an indirect effect on the relationship between SES and parental mediation. Unlike higher SES leading to higher digital literacy skills and then to enabling mediation, lower SES might result in lower digital literacy skills and in turn lead to restrictive mediation (Bayraktar, 2017). However, when parents have heavier work schedules regardless of their SES and digital literacy skills, they may be less available for any mediation strategy (Clark, 2011). Further research might consider these interaction and indirect effects within the framework of parenting for children's Internet use.

Conclusion

This narrative review has proposed a bi-factor conceptualization of parental mediation and a transactional framework that explains dynamic relationships between parental self-efficacy, mediation, and awareness of online risks and opportunities. It has hereby provided hypotheses for further research to test and provide further evidence for how parents can maximize opportunities and minimize risks online. For instance, the framework elaborates on (a) how parents' self-efficacy can directly hinder their awareness and (b) how the same parental characteristic can indirectly promote parental awareness.

The framework of parental *self-efficacy-mediation-awareness* is expected to facilitate further research on parental awareness *before* children's online risk experience. The reverse model as the parental *awareness-mediation-self-efficacy* is expected to guide further research on parental self-efficacy and mediation *after* parental awareness of children's online risk experience. The theoretical framework may facilitate further examinations of antecedents, defining attributes, and consequences of parental awareness, mediation, and self-efficacy as parenting for children's Internet use. Prospective findings might hereby produce clear policy advice for parents or intervention programs.

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